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AUTHOR	McCormick, Robert D.; Swanzy, Gene
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ABSTRACT

The Public Broadcasting System (PBS) Technical Center is located in Washington, D.C. This booklet describes the layout, equipment, status of personnel, and--briefly the functions of the center. Performance to date indicates that the center is meeting the design criteria of good technical quality and cost effectiveness. (JK)

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THE PUBLIC BROADCASTING SERVICE

TECHNICAL CENTER

by Robert D. McCormick, Senior Project Engineer
and
Gene Swanzy, Manager, Technical Operations

Public Broadcasting Service

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When PBS began its first season in the fall of 1970, it had almost no technical plant or staff. Origination feeds to the interconnection were being done on a contract basis by the Hughes Sports Network from their tape center in New York City. Tape duplication was being done on a contract basis by NET, Ann Arbor, Michigan. The costs for these services were very high in total, and several economic analyses were done to illustrate the large system savings which would be possible by combining the functions in a single plant with a high utilization factor. Even at the relatively low level of activity in 1970, the move was financially quite attractive and became progressively more so at each increase in service to the member stations.

Ford Foundation had committed funds for equipping a basic technical center early in the life of PBS, but construction could not begin until the question of location was resolved. Several locations were proposed and studied and many alternative plans were produced before final agreement by all parties on L'Enfant Plaza West as the location for both the Technical Center and the offices.

Design work and technical construction was done by PBS Engineering and Technical Operations. Items such as rack assembly, jackfield and patch cord construction, were started before the final lease signing occurred, but the bulk of the construction work had to

await the access to the site. Ten weeks after it was started, building construction and technical construction was far enough along to begin air operations and on May 14th, 1972 the first programming was fed to the interconnection. Two weeks later the phasing in of the tape duplication function was begun. Operations now are effectively around the clock seven days a week.

The Technical Center is housed on the second promenade level of L'Enfant Plaza West. The approach was austere. As an example, there is no ceiling, and ducts and cable ladders run exposed under the concrete slab. The entire area above the line of the hanging lights is painted flat black to be less noticeable. Air conditioning is separate from the building system, in order to be more economical for a seven day a week, 24 hour a day operation.

The layout includes a control room with an announce booth, a technical supervisor's office, a broadcast supervisor's office, a tape librarian's office, a small storage room/workshop, storage for approximately 200 pieces of video tape recording stock, and the equipment areas. Storage for an additional 5000 video tapes is located adjacent to the Technical Center area, and this space is being expanded to about double its present size.

The equipment consists of seven Ampex AVR-1 video tape machines, two of which are isolated in cubicles to provide the sound isolation needed for technical screening purposes, two telecine

islands, telephone company audio/video terminal equipment, and a transmission area in which are located the terminal equipment racks housing monitoring, switching, distribution, pulse equipment, and an audio logging recorder for legal reference.

The telecine islands are RCA equipped with TK-27 cameras, TP-55 multiplexers, TP-66 film projectors, and TP-7 slide projectors. One island has two 16mm film projectors, the other has one, and space for a 35mm. Synchronous magnetic dubbing equipment is installed and interlocked operation of the film equipment is possible.

Three video tape machines are equipped with electronic editors. Film splicing and editing can be accomodated at medium levels of complexity. Therefore, film or tape materials may be assembled into a composite master, and a final film-to-tape transfer, synchronous double system if necessary, may be made.

The switcher is an audio/video model of the 1400 series manufactured by the Grass Valley Group. It has limited audio breakaway facilities, special effects and a downstream keying amplifier. It is currently being modified to expand its output capabilities.

Audio equipment consists of a 4-track Ampex AG-440 machine with ¼ inch or ½ inch capability, (soon to have a video tape

synchronizer unit), a five-position Spotmaster cartridge playback machine, and a single-position Spotmaster cartridge record and playback machine. The single-position Spotmaster is normally dedicated to the storage and playback of data from the Datavision character generator, but may be used for air audio as needed.

The master timing reference is a Tracor rubidium frequency standard which drives both the digital clock system and the master color sync generator. Each video tape machine and film camera has its own sync generator which is sync locked through a small distribution system to the master generator. Although it is rarely done, any machine or a group of machines can be split away and operated in a separate sync lock mode. The single control room can be made a part of any group, which must then of necessity be locked to whatever local or remote video is being fed through the switcher.

Several major items of equipment were deferred due to lack of funds, including emergency power generating equipment, a routing switcher, and a back-up control room and switcher. Space has been reserved for these items, and the power distribution has been designed to accomodate the eventual installation of the emergency generator. The layout allows for expansion of duplication capacity to accomodate the Public Television Library operation when funds become available for it to transfer

from Bloomington, Indiana. At PTL's current level of bookings the total tape duplication load would nearly double upon inclusion of the library work, and this level of activity is planned for and can be accomodated should it prove necessary in the future.

The normal technical crew assigned to the air operation totals four men, a switcher operator, a transmission operator, a video-tape-Telecine operator, and a maintenance man. The machines are all remotely controlled by the switcher operator, who works from times and cueing information furnished him on the daily rundown sheet and schedules. The transmission operator normally handles all outside contact on technical matters with AT&T plant employees, stations, or technical personnel or remote feeds.

Screening of program submissions from member stations or other production agencies, or video tape editing operations, can take place simultaneously with the origination operation. Tape duplication for non-interconnected stations is done during off-air hours so that all tape machines can be used simultaneously.

During the time of all broadcasts, an employee of the Network Operations Department, called a Broadcast Supervisor, is assigned to cover non-technical contacts with program suppliers, AT&T Sales and Traffic, and stations. He makes decisions regarding

refeeds of programs, and orders network switches or facilities as necessary from AT&T. The library functions are under Network Operations, and the librarian handles program materials in and out, and supplies programs to the video tape/telecine operators for air or duplication use.

There are currently twenty-one technicians in all categories on the staff. Five of these are Assistant Technicians, trainees who are receiving on-the-job training. Two of the men who are now Technicians started as Assistant Technicians and were promoted in each case after approximately three months on the job. We have indicated to the Assistant Technicians that we expect them to acquire their F.C.C. First Class Radiotelephone Operator's License and otherwise demonstrate their interest and proficiency to be at a level sufficient for promotion within one year after beginning the training program, as we don't want anyone to be a career trainee.

Origination from the Technical Center is up 40% from January of 1972, now averaging 45 hours a week. Program duplication has leveled off at about 300 program units per week. Since the amount budgeted for these two categories in FY '73 is down about 30% from FY '72, when they were contracted out, the greatest possible efficiency of operation must be maintained to be within the budget. This goal is furthered by better than projected

performance in video head wear and tape damage. Returned video tapes are exhibiting an average of 1.6% unrecoverable edge damage and 0.9% unrecoverable foreign particulate contamination with the total attrition less than 2.5%. (Some tapes exhibit both problems, so the totals don't add.)

Performance to date indicates that the PBS Technical Center is meeting the design criteria of good technical quality and cost effectiveness. It has proved to be capable of performing the functions presently required of PBS.